I. REAL PARTY IN INTEREST

The application has been assigned to PPG Industries Ohio, Inc., the assignment was recorded at Reel 014756/Frame 0028 on November 26, 2003.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals, interferences and other judicial proceedings. A related proceedings Appendix X is attached to this Brief.

III. STATUS OF CLAIMS

Claims 82-121 are pending and a copy appears in Appendix VIII to this Brief. Claims 82-121 are rejected and appealed. Claims 1-81, and 122-124 have been withdrawn from consideration.

IV. STATUS OF AMENDMENTS

An amendment subsequent to the final rejection of December 23, 2005 was mailed on January 24, 2006. The amendment was not entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention as set forth in the only independent Claim 82 relates to a continuous process for making a copolymer composition (page 5, lines 1 and 2; page 14, lines 8 and 9). In the process one or more monomers such as set forth in element (b) of Claim 82 (page 5, lines 6-14; also FIG. 1 numerals 12 and 16) as well as polymerization initiators (page 5, lines 15 and 16; also FIG. 1 numeral 20) are fed (numerals 14, 18 and 22; 11, 13 and 19; 15; 24; 28) into a pressurized stirred tank reactor (STR) (numeral 26). The monomers and initiators are retained in the STR for a time sufficient to convert the monomers to copolymer (page 5, lines 19-21). The copolymer composition is removed from the STR at essentially the same rate as the

monomers and the initiators are added (page 14, lines 8-11, and FIG. 1 numerals 30, 34, 36 and 38). Unreacted monomers are removed from the copolymer composition and used as feed monomers (page 14, lines 11-12; FIG. 1 numeral 40, and page 13, lines 7-12). The liquid level in the STR is maintained such that there is substantially no air or vapor space (page 5, lines 17 and 18).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 82-121 are unpatentable under judicially created Doctrine of Obviousness Type Double Patenting over Claims 1-48 of Coca et al. (U.S. Patent 6,677,422) in view of Dankworth et al. (U.S. Patent 5,650,536) and E. Bruce Nauman ("Chemical Reactor Design, Optimization, and Scaleup", McGraw-Hill, 2002).

Whether Claims 82-103 and 105-121 are unpatentable under 35 U.S.C. 103(a) over the three (3) references mentioned immediately above.

Whether Claim 104 is unpatentable under 35 U.S.C. 103(a) over the three (3) references mentioned above further in view of Jarvis et al. (U.S. Patent 4,728,701).

VII. ARGUMENT

Rejection of Claims 81-121 for Obvious Type Double Patenting Over Claims 1-48 of Coca et al. (U.S. Patent No. 6,677,422) in view of Dankworth et al. (U.S. Patent No. 5,650,536) And E. Bruce Nauman ("Chemical Reactor Design, Optimization and Scaleup", McGraw-Hill 2002)

In determining the appropriateness of a double patenting rejection, the claims of U.S. Patent No. 6,677,422 (Coca et al. patent) are compared with the claims of the present invention. Also, the skill of the art as shown by the secondary references is taken into consideration.

Although the claims of the Coca et al. patent relate to a process for polymerizing monomers, such as the type required by Appellants' claims, and a STR is used for the polymerization, there is no language in the claims of the Coca et al. patent of a continuous process for making the polymer in which the polymer is withdrawn from the

STR at essentially the same rate that the monomers and initiators are introduced and any unreacted monomers are removed from the polymer and used at least as part of one of the monomers being fed to the reactor. Also, there is no language in the claims of the Coca et al. patent of maintaining the liquid level in the STR such that there is no air or vapor space. The mere fact that the claims of Coca et al. may dominate the present claims does not necessarily follow that there is double patenting.

Although the Dankworth et al. patent (U.S. Patent No. 5,650,536) relates to a continuous process, the process is not for polymerizing monomers to polymers. In the Dankworth et al. process, a polymer is reacted with carbon monoxide and a nucleophilic trapping agent in the presence of an acid catalyst. This results in the formation of the carboxylic acid or carboxylic ester-containing polymer depending upon the choice of the nucleophilic trapping agent. There is no suggestion in Dankworth et al. of a continuous process for preparing polymers in which monomers are polymerized with one another such as is required by Appellants' claims. Rather, in Dankworth et al., a preformed polymer is reacted with carbon monoxide. Also, contrary to the position expressed in the Offical Action, there is no disclosure in Dankworth et al. of maintaining the liquid level in the STR such that there is substantially no air or vapor space. The disclosure in Dankworth et al. that the STR is operated in a substantial absence of air and a constant liquid level is not an indication that there is substantially no vapor space in the reactor. In fact, the contrary is so. One of the reactants in Dankworth et al. is carbon monoxide, a gas. Therefore there must be vapor space in the reactor. Evidence of this can be seen in the working examples of Dankworth et al., specifically Examples A and B, which clearly indicate the presence of a vapor space in the reactor. Carbon monoxide fills the vapor space of the reactor.

Also, the E. Bruce Nauman reference does not overcome the deficiencies associated with the above two references. This reference merely discloses the benefits of a series of continuous stirred reactors. Therefore, it is requested that the double patenting rejection associated with Claims 81-121 be reversed.

Rejection of Claims 82-103 and 105-121 under 35 U.S.C. 103(a) Over The Above-Mentioned Coca et al., Dankworth et al. And E. Bruce Nauman References

With regard to the rejection of the Claims 82-103 and 105-121 under 35 U.S.C. 103(a) over the same combination of references mentioned above, the above arguments would appear to be equally applicable. There is no disclosure in the Coca et al. patent of a continuous process. Likewise, although the Dankworth et al. secondary reference discloses a continuous process, the process is associated with reacting carbon monoxide with a polymer rather than polymerizing a mixture of monomers to form a polymer as required by Appellants' claims. Therefore, it is difficult to understand how one would modify Coca et al. by the process of Dankworth et al. to arrive at Appellants' claims. The two processes are unrelated. Further, there is no disclosure in Coca et al. or Dankworth et al. of conducting their processes by maintaining the liquid level in the STR, such that there is no air or vapor space in the reactor.

Rejection of Claim 104 under 35 U.S.C. 103(a) Over The Above-Mentioned Coca et al. and Dankworth et al. References Further In View of Jarvis et al. (U.S. Patent No. 4,728,701)

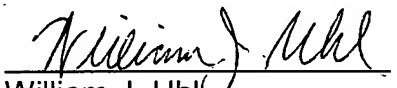
The Jarvis et al. reference has been cited as being pertinent to Claim 104 wherein a back pressure control valve is positioned on an outlet. However, there is no teaching in Jarvis et al. to overcome the shortcomings in the three (3) references mentioned above.

Appellants' claims for a continuous process of polymerizing monomer to polymer, do not raise a double patenting issue with Claims 1-48 of Coca et al. (U.S. Patent 6,677,422). The Coca et al. claims do not mention a continuous process nor of maintaining the liquid level in the STR such that there is no air or vapor space. The secondary references of Dankworth et al. (U.S. Patent 5,650,536) and E. Bruce Nauman to show the skill of the art, do not overcome the deficiency of Coca et al. The secondary references do not relate to a process for polymerizing monomer to polymer and do not disclose maintaining the liquid level in the STR such that there is no air or vapor space.

For the same reasons, it is submitted that Appellants' claims are not obvious under 35 U.S.C. 103(a) over these references.

Therefore, reversal of all the Examiner's rejections and allowance of Claims 82-121 is respectfully requested.

Respectfully submitted,



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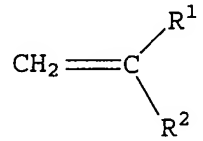
VIII. CLAIMS APPENDIX

82. A continuous process for making a copolymer composition containing residues of at least one olefinic monomer comprising the steps of:

(a) providing at least one pressurized stirred tank reactor (STR) having at least one inlet and at least one outlet;

(b) feeding one or more monomer compositions to an STR by way of at least one of the inlets, wherein at least one monomer composition comprises one or more monomers having the following structure (I):

(I) 

wherein R^1 is linear or branched C_1 to C_4 alkyl and R^2 is selected from the group consisting of methyl, linear, cyclic or branched C_1 to C_{20} alkyl, alkenyl, aryl, alkaryl and aralkyl, any of which can optionally include one or more functional groups;

(c) feeding one or more initiator compositions to the STR by way of one or more of the inlets;

(d) maintaining the liquid level in the STR such that there is substantially no air or vapor space in the reactor;

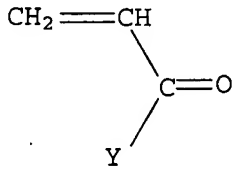
(e) maintaining the monomer compositions in (b) and the initiator compositions in (c) in the STR for a residence time sufficient to effect conversion of the monomers to a copolymer composition; and

(f) discharging the copolymer composition by way of the outlet;

wherein the monomers and initiators are introduced to the STR at essentially the same rate as the copolymer is withdrawn from the STR and any unreacted monomers of structure (I) are removed from the copolymer and used as part of at least one of the monomers compositions in (b).

83. The method of claim 82, wherein at least one monomer composition in (b) comprises one or more monomers selected from the group consisting of styrene, substituted styrenes, methyl styrene, substituted methyl styrenes, vinyl ethers and vinyl pyridine.

84. The method of claim 82, wherein at least one monomer composition in (b) comprises one or more monomers selected from the group consisting of acrylonitrile and acrylic monomers described by structure (III):

(III) 

wherein Y is selected from the group consisting of $-NR^3{}_2$,-O-R^5-O-C(=O)-$NR^3{}_2$, and –OR^4; R^3 is selected from the group consisting of H, linear or branched C_1 to C_{20} alkyl and linear or branched C_1 to C_{20} alkylol; R^4 is selected from the group consisting of H, poly(ethylene oxide), poly(propylene oxide), linear or branched C_1 to C_{20} alkyl, alkylol, aryl, alkaryl and aralkyl, linear or branched C_1 to C_{20} fluoroalkyl, fluoroaryl and fluoroaralkyl, a siloxane, a polysiloxane, an alkyl siloxane, an ethoxylated trimethylsilyl siloxane and a propoxylated trimethylsilyl siloxane; R^5 is a divalent linear or branched C_1 to C_{20} alkyl linking group; and R^3 and/or R^4 optionally include one or more functional groups.

85. The method of claim 82, wherein the monomer of structure (I) is selected from the group consisting of isobutylene, diisobutylene, dipentene, isoprenol, and mixtures thereof.

86. The method of claim 82, wherein the group R^2 of the monomer of structure (I) includes one or more functional groups selected from the group consisting of epoxy, carboxylic acid, hydroxy, amide, oxazoline, acetoacetate, isocyanate, carbamate, amine, amine salt, quaternized amine, thiol, methylol, methylol ether, and sulfonium salt.

87. The method of claim 84, wherein Y includes at least one functional group of one or more selected from the group consisting of epoxy, carboxylic acid, hydroxy, amide, oxazoline, acetoacetate, isocyanate, carbamate, amine, amine salt, quaternized amine, thiol, methylol, methylol ether, and sulfonium salt.

88. The method of claim 82, wherein the resulting copolymer composition is reacted such that one or more functional groups are incorporated into the copolymer.

89. The method of claim 88, wherein the functional groups incorporated into the copolymer are one or more selected from the group consisting of epoxy, carboxylic acid, hydroxy, amide, oxazoline, acetoacetate, isocyanate, carbamate, amine, amine salt, quaternized amine, thiol, methylol, methylol ether, and sulfonium salt.

90. The method of claim 82, wherein the initiator composition comprises a thermal free radical initiator.

91. The method of claim 90, wherein the thermal free radical initiator is selected from the group consisting of a peroxide compound, an azo compound, a persulfate compound, and mixtures thereof.

92. The method of claim 91, wherein the peroxide compound is one or more selected from the group consisting of hydrogen peroxide, methyl ethyl ketone peroxides, benzoyl peroxides, di-t-butyl peroxides, di-t-amyl peroxides, dicumyl peroxides, diacyl peroxides, decanoyl peroxide, lauroyl peroxide, peroxydicarbonates, peroxyesters, dialkyl peroxides, hydroperoxides, and peroxyketals.

93. The method of claim 91, wherein the azo compound is one or more selected from the group consisting of 4-4'-azobis(4-cyanovaleric acid), 1-1'-azobiscyclohexanecarbonitrile, 2-2'-azobisisobutyronitrile, 2-2'-azobis(2-methylpropionamidine) dihydrochloride, 2-2'-azobis(2-methylbutyronitrile), 2-2'-azobis(propionitrile), 2-2'-azobis(2,4-dimethylvaleronitrile), 2-2'-azobis(valeronitrile), 2,2'-azobis[2-methyl-N-(2-hydroxyethyl)propionamide], 4,4'-azobis(4-cyanopentanoic acid), 2,2'-azobis(N,N'-dimethyleneisobutyramidine), 2,2'-azobis(2-amidinopropane) dihydrochloride, 2,2'-azobis(N,N'-dimethyleneisobutyramidine) dihydrochloride, and 2-(carbamoylazo)-isobutyronitrile.

94. The method of claim 82, wherein any of the monomer compositions contain one or more of the monomers selected from the group consisting of hydroxyethyl acrylate, hydroxypropyl acrylate, acrylic acid, methyl acrylate, ethyl acrylate, butyl acrylate, isobutyl acrylate, isobornyl acrylate, dimethylaminoethyl acrylate, acrylamide, chlorotrifluoroethylene, glycidyl acrylate, 2-ethylhexyl acrylate and n-butoxy methyl acrylamide.

95. The method of claim 82, wherein after discharging the copolymer composition in (f), the copolymer composition is fed to a flash tank.

96. The method of claim 95, wherein unreacted monomer of structure (I) is substantially recovered from the resulting copolymer composition by applying a vacuum to the flash tank.

97. The method of claim 95, wherein the copolymer composition is discharged from the flash tank.

98. The method of claim 82, wherein after discharging the copolymer composition in (f), the copolymer composition is mixed with a solvent.

99. The method of claim 96, wherein the recovered unreacted monomer of structure (I) comprises a portion of the monomer composition in (b).

100. The method of claim 82, wherein the residence time in the STR in (e) is from 5 minutes to six hours.

101. The method of claim 82, wherein the residence time in the STR in (e) is a period of time sufficient to incorporate at least 75 mole % of the monomers of structure (I) into the copolymer composition.

102. The method of claim 82, wherein mixing is applied by the STR in (e).

103. The method of claim 82, wherein no mixing is applied in (e).

104. The method of claim 82, wherein a back pressure control valve is positioned on the outlet.

105. The method of claim 82, wherein the pressure in the STR is maintained at a pressure above the vapor pressure of any monomer in any of the monomer compositions in (b).

106. The method of claim 82, wherein the pressure in the STR is from 300 to 1,000 psi.

107. The method of claim 82, wherein the monomer compositions in (b) and the initiator compositions in (c) are fed to the STR by way of high pressure pumps.

108. The method of claim 82, wherein the monomer compositions in (b) and the initiator compositions in (c) are mixed prior to being fed to the STR.

109. The method of claim 82, wherein the inlets empty into a bottom portion of the STR.

110. The method of claim 108, wherein the monomer compositions in (b) and the initiator compositions in (c) are mixed using a static mixer.

111. The method of claim 82, wherein the temperature in the reactor is maintained at a temperature of from 50°C to 300°C.

112. The method of claim 82, wherein after discharging the copolymer composition in (f), the copolymer composition is fed to a second STR.

113. The method of claim 112, wherein the copolymer composition is fed from the second STR to a third STR and discharged therefrom.

114. The method of claim 112, wherein the copolymer composition is discharged from the second STR to a flash tank.

115. The method of claim 113, wherein the copolymer composition is discharged from the third STR to a flash tank.

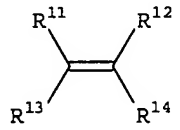
116. The method of claim 82, wherein after discharging the copolymer composition in (f), the copolymer composition is fed to a wipe film evaporator.

117. The method of claim 116, wherein the copolymer composition is discharged from the wipe film evaporator to a flaker to provide the copolymer composition in dry form.

118. The method of claim 82, wherein the monomer compositions in (b) comprise greater than 50 mole %, based on the total number of moles of monomer in the monomer compositions of the monomers of structure (I).

119. The method of claim 118, wherein the amount of the monomers in structure (I) do not exceed 55 mole %.

120. The method of claim 82, wherein one or more of the monomer compositions in (b) include one or more residues derived from other ethylenically unsaturated monomers of general structure (IV):

(IV) 

wherein R^{11}, R^{12} and R^{14} are independently selected from the group consisting of H, CF_3, straight or branched alkyl of 1 to 20 carbon atoms, aryl, unsaturated straight or branched alkenyl or alkynyl of 2 to 10 carbon atoms, unsaturated straight or branched alkenyl of 2 to 6 carbon atoms substituted with a halogen, C_3-C_8 cycloalkyl, heterocyclyl and phenyl; R^{13} is selected from the group consisting of H, C_1-C_6 alkyl, $COOR^{15}$, wherein R^{15} is selected from the group consisting of H, an alkali metal, a C_1 to C_6 alkyl group, glycidyl and aryl, which can optionally include one or more functional groups.

121. The method of claim 120, wherein the other ethylenically unsaturated monomers are one or more selected from the group consisting of methacrylic monomers and allylic monomers.

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE